

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Appl. No.	:	10/828,745	Confirmation No. 5487
Applicant	:	Michael L. Whitehead et al.	
Filed	:	April 21, 2004	
Title	:	METHOD AND SYSTEM FOR SATELLITE BASED PHASE MEASUREMENTS FOR RELATIVE POSITIONING OR SLOW-MOVING POINTS IN CLOSE PROXIMITY	
TC/A.U.	:	3662	
Examiner	:	Gregory C. Isssing	
Docket No.	:	4011	
Date	:	June 20, 2008	

Commissioner for Patents  
PO Box 1450  
Alexandria, VA 22313-1450

**SUPPLEMENTAL RULE 1.131 DECLARATION OF PRIOR INVENTION**

I, MICHAEL L. WHITEHEAD, state and aver as follows:

1. I am over 18 years of age and am qualified to make this declaration.
2. Attached hereto is a true and correct copy of a disclosure of the subject matter of the patent application identified above, which was authored and date-stamped by me on or about January 28, 2003. (Attachment A)
3. Attachment A describes many of the concepts described in the above patent application. For example, Section 2 discusses a system including multiple GPS receivers, which are constrained relative to each other with fixed distances, fixed geometries and/or common clocks. GPS signals are received and solutions are computed in unison whereby measurements are added to the positioning solution equation faster than unknowns. By contrast, systems with unrestrained independent GPS receivers require independent location computations for each receiver in order to obtain complete solutions. Furthermore, multipath and other noise sources can be averaged out using this constrained receiver set method.
4. Applications disclosed in Attachment A include those covered in the above application, i.e. fixed position and slow-moving systems wherein one or more GPS receivers are seeing only a small subset of the available satellites, but position solutions can be determined using the other information, i.e. constrained distance and geometry (e.g., orientation) among the receivers.

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Supplemental Rule 131 Declaration of Michael Whitehead

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I hereby declare that all statements made herein of my own knowledge are true, all statements made herein on information and belief are believed to be true, and further that these statements were made with the knowledge that willful false statements and the like are punishable by fine or imprisonment, or both, under 18 U.S.C. 1001 and may jeopardize the validity of the application or any patent issuing thereon.

6/19/2008  
Date

  
Michael L. Whitehead

1/28/2003

Michael Whitehead

The following Ideas have been kicking around the company (CSI-Wireless) for the last several years.

- 1) Sending differential correctors for GPS from a first GPS base station or network of GPS base stations to a second GPS receiver over some communication's link. Then, forwarding that differential to nearby receivers over a different communication link, like for example blue-tooth or RS-232 or CAN network. The unique concept here is that we save cost in since the original communication link only needs to be established between the said first GPS Base station(s) and the 2<sup>nd</sup> GPS receiver. Additional GPS receivers nearby to the 2<sup>nd</sup> GPS receiver then gain the benefit of differential GPS using a lower-cost, or more flexible communication link. If for example, sending differential correctors to all nearby GPS receivers on a CAN network means that those nearby receivers get the benefits of the differential correctors without a perhaps expensive radio.
- 2) Using a redundant array of GPS receivers to obtain a location for one or more of these receivers where the location of each receiver is constrained relative to the other receiver by a fixed distance and/or geometry and/or common clock. By receiving GPS signals and computing the solution in unison, we gain the advantage of adding measurements to the equation faster than we do unknowns as compared to the situation of unconstrained GPS receivers for which the location is computed independently for each. Furthermore, since multipath and other sources of noise may be independent at each GPS receiver, the method has the advantage of averaging out the effects of noise. Another aspect of the invention is that it allows for computing GPS location in a situation where one or more of the GPS receivers are only seeing a small subset of the available satellites so that a solution would not be possible without the method described. For example, one receiver on one side of a wall sees 3 satellites, and another on another side of the wall sees 3 satellites. Separately, a solution could not be obtained, as it requires 4 satellites for each. But if they used common clocks and were separated by a known distance, then you have a total of 6 measurements and 6 unknowns (4 unknowns for location and clock of one receiver, and 2 more for the bearing of the other receiver.). Instead of a wall, this could be a ship with a large crane obstructing the common view of all satellites.

ATTACHMENT A